Volunteer Lake Assessment Program Individual Lake Reports

POWWOW POND, KINGSTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	20,160	**Max. Depth (m):**	3.2	**Flushing Rate (yr^{-1}):**	30.3
Surface Area (Ac.):	247	**Mean Depth (m):**	1.3	**P Retention Coef:**	0.39
Shore Length (m):	13,000	**Volume (m^3):**	1,296,000	**Elevation (ft):**	116

TROPHIC CLASSIFICATION

Year	Trophic class
1976	MESOTROPHIC
1998	EUTROPHIC

KNOWN EXOTIC SPECIES

Variable Milfoil

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

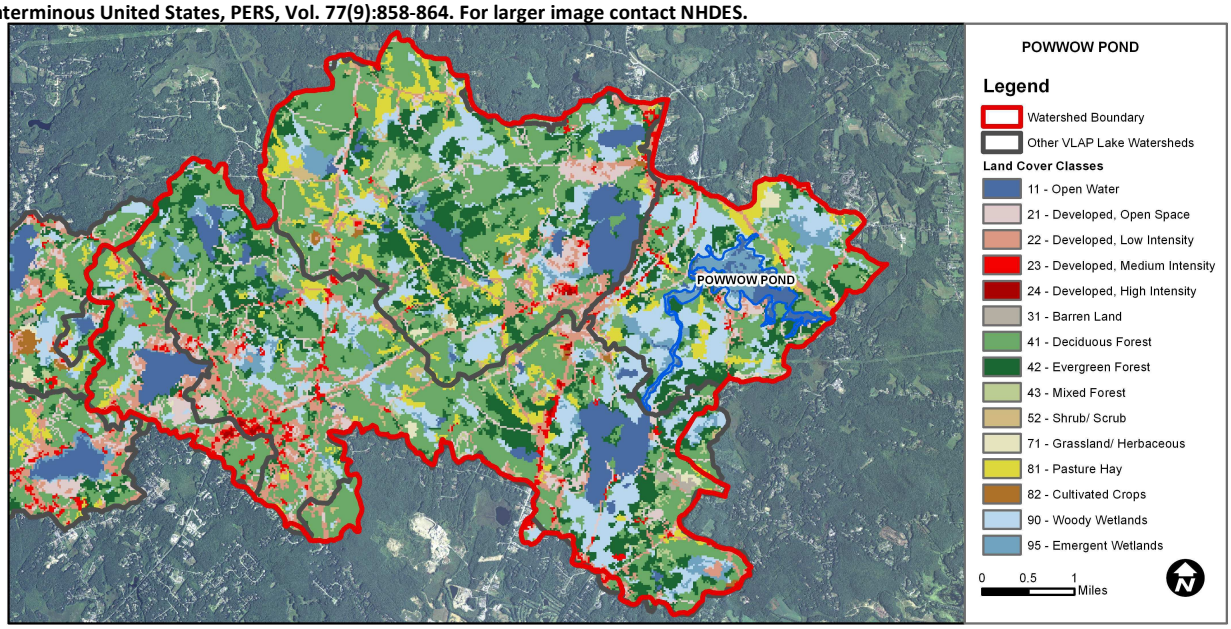
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

POWWOW RIVER - TRICKLIN' FALLS BEACH	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

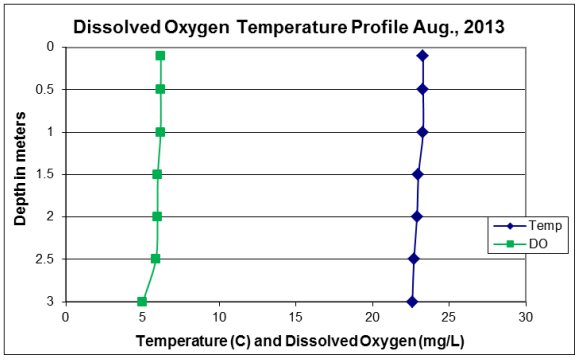


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.82	Barren Land	0.17	Grassland/Herbaceous	0.4
Developed-Open Space	6.04	Deciduous Forest	35.66	Pasture Hay	5.22
Developed-Low Intensity	7.98	Evergreen Forest	14.8	Cultivated Crops	0
Developed-Medium Intensity	2.19	Mixed Forest	1.75	Woody Wetlands	14.24
Developed-High Intensity	0.16	Shrub-Scrub	0.83	Emergent Wetlands	3.55

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
POWWOW POND, EAST KINGSTON, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in July but decreased to average levels in August. The 2013 average chlorophyll was slightly greater than 2012 and the state median.
- **CONDUCTIVITY/CHLORIDE:** Conductivity was elevated and greater than the state median at all stations, particularly the Epilimnion, Outlet, Powwow River Inlet, and Rte. 125 Inlet.
- **E. COLI:** E. coli levels were much less than the state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus was slightly greater than the state median, stable throughout the summer, and slightly less than the 2012 average. Bakie Brook and Rte. 125 Inlet experienced elevated phosphorus levels potentially due to flushing of wetland systems. Powwow River Inlet experienced elevated phosphorus in July potentially due to low flow conditions. Phosphorus levels have increased in Rte. 125 Inlet since2005 potentially due to the increase of significant storm events.
- **TRANSPARENCY:** Transparency improved as the summer progressed, however remained lower than normal. Visual inspection of historical data indicates a decreasing transparency since monitoring began.
- **TURBIDITY:** Epilimnetic and Rowell Cove turbidity were slightly elevated in June potentially due to significant storm events prior to sampling. Powwow River inlet turbidity was elevated in July potentially due to low flow conditions.
- **PH:** Epilimnetic pH was sufficient to support aquatic life however has been below desirable range of 6.5 – 8.0 units in the past. Rte. 125 Inlet pH was low and potentially critical to aquatic life.
- **RECOMMENDED ACTIONS:** The increased frequency and intensity of storm events highlights the importance of managing stormwater runoff in the pond's watershed. The flushing of wetland systems is also contributing phosphorus and intensifying the tea colored hue to the water which may be causing the decrease in pond transparency. Educate lake and watershed residents on ways to reduce stormwater runoff from their properties utilizing DES' "Homeowner's Guide to Stormwater Management".



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

Table 1. 2013 Average Water Quality Data for POWWOW POND

Station Name	Alk.	Chlor-a	Cond.	E. Coli	Total P	Trans.		Turb.	pH
	mg/l	ug/l	uS/cm	#/100ml	ug/l	m		ntu	
						NVS	VS		
27 Cove Rd				10					
Bakie Brook			85.6		70			1.36	6.04
Epilimnion	12.6	5.74	164.1		15	1.36	1.89	1.16	6.60
Outlet			165.2		15			0.94	6.80
Powwow River Inlet			172.3		24			1.40	6.20
Rowell Cove			97.8		31			1.28	6.33
Rte 125 Inlet			131.1		50			0.32	4.38
Sandy Point				10					

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.